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MARKING rubric 7

**Assignment 01 – The GMG Movie Database Design**

Your database development team (comprising of 2-3 members) has been commissioned to design a set of database tables that will be used to track information for GMG, a movie production studio. The database should track the following information:

* The names of the movies.
* The year which a movie was produced.
* The rating for the movie. (e.g. G, PG, PG-13, r, etc.)
* The first and last names of the producer for each movie. (assume that there is only one producer per movie)
* The first and last names of each actor in each movie.
* Keep track of the main and supporting actors in a movie.
* The amount of money each actor was paid for making the movie.
* The names and addresses of the theatres where each movie was shown. (there can be many theatres, possibly thousands, where each movie was shown)
* The number of tickets sold for each movie at each theatre.
* The price per ticket at each theatre - for the purpose of this assignment you should assume that a theatre charges the same amount of money for every ticket that it sells.

There are many different database designs that can be used to store this information. Whatever design you choose, make sure that it is in **3rd Normal Form**. Create the appropriate amount of tables and the optimum number of fields in those tables. Feel free to create extra fields to hold primary key values if you wish.

Tasks:

Model a relational database using a(n):

1. **Entity Relationship Diagram** (50 marks), and
2. **Data Dictionary** (50 marks)

that adequately contains the relevant amount of information needed to help database programmer build tables within the database.

A sample format for a data dictionary is shown below. Feel free to use either this format or any other relevant format as a reference for your own data dictionary.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ORDER\_ITEM** | | | | |
| Attribute name | Data type | Size | Constraint | Comment |
| Ord\_no | Number |  | Not null | FK to Order |
| Prod\_code | Varchar2 | 10 |  | FK to Product |
| Qty | Number |  | >0 |  |
| Price | Number |  | >0 | Price of product |
| Total | Number |  | Check | total = price \* quantity |
| Qty\_filled | Char | 1 | Y or N default to N | Has the product been delivered? |
| Ship\_id | Number |  | >0 | FK to Cust\_Ship |

**[Total: 100 marks]**

**Task a: Entity Relationship Diagram**

**NORMALIZATION PROCESS**

* **Unnormalized Normal Form (UNF)**
* The Movie table is in unnormalized form and suffers from anomalies.

**Movie** (movie\_id {PK}, movie\_name, year\_produced, genre, runtime, rating, producer\_id, producer\_firstname, producer\_lastname, producer\_gender, (actor\_id, actor\_firstname, actor\_lastname, actor\_gender, role, payment)\*, (theatre\_id, theatre\_name, theatre\_status, price\_per\_ticket, address\_unit, street, city, postcode, state, country, quantity\_sold, return\_sales)\*)

* **First Normal Form (1NF)**
* Repeating groups are identified, removed, and appropriately placed into new tables.
* The Composite Key of the new tables are determined.
* The number “1” is appended to the table names to indicate 1NF.

**Movie-1** (movie\_id {PK}, movie\_name, year\_produced, genre, runtime, rating, producer\_id, producer\_firstname, producer\_lastname, producer\_gender)

**CastMember-1** (movie\_id {PPK}, actor\_id {PPK}, actor\_firstname, actor\_lastname, actor\_gender, role, payment)

**TicketSale-1** (movie\_id {PPK}, theatre\_id {PPK}, theatre\_name, theatre\_status, price\_per\_ticket, address\_unit, street, city, postcode, state, country, quantity\_sold, return\_sales)

* **Second Normal Form (2NF)**
* Attributes that are partially functionally dependent on the Composite Keys in the previously added tables are identified, removed, and appropriately placed into new tables.
* The Primary Key of the new tables are determined.
* The number “2” is appended to the table names to indicate 2NF.

**Movie-2** (movie\_id {PK}, movie\_name, year\_produced, genre, runtime, rating, producer\_id, producer\_firstname, producer\_lastname, producer\_gender)

**CastMember-2** (movie\_id {PPK}, actor\_id {PPK}, role, payment)

**Actor-2** (actor\_id {PK}, actor\_firstname, actor\_lastname, actor\_gender)

**TicketSale-2** (movie\_id {PPK}, theatre\_id {PPK}, quantity\_sold, return\_sales)

**Theatre-2** (theatre\_id {PK}, theatre\_name, theatre\_status, price\_per\_ticket, address\_unit, street, city, postcode, state, country)

* **Third Normal Form (3NF)**
* The Movie table has transitive dependencies, thus attributes that are transitively functionally dependent on non-key attributes are identified, removed, and placed into a new table.
* The Primary Key of the new table is determined.
* The number “3” is appended to the table names to indicate 3NF.

**Movie-3** (movie\_id {PK}, movie\_name, year\_produced, genre, runtime, rating, producer\_id {FK})

**Producer-3** (producer\_id {PK}, producer\_firstname, producer\_lastname, producer\_gender)

**CastMember-3** (movie\_id {PPK}, actor\_id {PPK}, role, payment)

**Actor-3** (actor\_id {PK}, actor\_firstname, actor\_lastname, actor\_gender)

**TicketSale-3** (movie\_id {PPK}, theatre\_id {PPK}, quantity\_sold, return\_sales)

**Theatre-3** (theatre\_id {PK}, theatre\_name, theatre\_status, price\_per\_ticket, address\_unit, street, city, postcode, state, country)

**ENTITY RELATIONSHIP DIAGRAM**

**Diagram

Description automatically generated**

**Task b: Data Dictionary**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Movie** | | | | |
| Attribute name | Data type | Size | Constraint | Comment |
| movie\_id | VARCHAR | 6 | Primary key | PK of Movie |
| movie\_name | VARCHAR | 100 | NOT NULL | Full name of movie |
| year\_produced | NUMBER | 4 | >0 | Year of movie production |
| genre | VARCHAR | 15 |  | Main genre of movie in 1 word |
| runtime | NUMBER | 3 | NOT NULL | Full length of movie in minutes |
| rating | VARCHAR | 5 | G, PG, PG-13, R, NC-18, U, P13 or 18, default to U | Rating for the movie |
| producer\_id | NUMBER | 6 | Foreign key | FK to Producer, ID of the producer of the movie |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Producer** | | | | |
| Attribute name | Data type | Size | Constraint | Comment |
| producer\_id | VARCHAR | 6 | Primary key | PK of Producer |
| producer\_firstname | VARCHAR | 50 | NOT NULL | First name of producer |
| producer\_lastname | VARCHAR | 50 | NOT NULL | Last name of producer |
| producer\_gender | CHAR | 1 | M, F, or O, default to O | Gender of producer; M for Male, F for Female, O for Other |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Actor** | | | | |
| Attribute name | Data type | Size | Constraint | Comment |
| actor\_id | VARCHAR | 6 | Primary key | PK of Actor |
| actor\_firstname | VARCHAR | 50 | NOT NULL | First name of actor |
| actor\_lastname | VARCHAR | 50 | NOT NULL | Last name of actor |
| actor\_gender | CHAR | 1 | M, F, or O, default to O | Gender of actor; M for Male, F for Female, O for Other |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CastMember** | | | | |
| Attribute name | Data type | Size | Constraint | Comment |
| actor\_id | VARCHAR | 6 | Primary key, Foreign Key | PPK of CastMember, FK to Actor |
| movie\_id | VARCHAR | 6 | Primary key, Foreign Key | PPK of CastMember, FK to Movie |
| role | CHAR | 1 | M or S, default to S | Role of the actor in the movie; M for Main, S for Supporting |
| payment | NUMBER | 9 | >0 | Money paid to actor for their role in the movie |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TicketSale** | | | | |
| Attribute name | Data type | Size | Constraint | Comment |
| movie\_id | VARCHAR | 6 | Primary key, Foreign Key | PPK of TicketSale, FK to Movie |
| theatre\_id | VARCHAR | 6 | Primary key, Foreign Key | PPK of TicketSale, FK to Theatre |
| quantity\_sold | NUMBER |  | NOT NULL | Total quantity of tickets sold |
| return\_sales | NUMBER |  | NOT NULL | Total amount of money earned from ticket sales |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Theatre** | | | | |
| Attribute name | Data type | Size | Constraint | Comment |
| theatre\_id | VARCHAR | 6 | Primary key | PK of Theatre |
| theatre\_name | VARCHAR | 30 | NOT NULL | Full name of theatre |
| theatre\_status | CHAR | 1 | Y, N, or U default to U | Is the theatre still operating? Y for Yes, N for No, U for Unknown |
| price\_per\_ticket | NUMBER |  | >0 | Price of each ticket sold at the theatre |
| address\_unit | VARCHAR | 10 | NOT NULL | Unit number of address |
| street | VARCHAR | 50 | NOT NULL | Street address of theatre |
| city | VARCHAR | 30 | NOT NULL | City of which the theatre is located |
| postcode | VARCHAR | 10 | NOT NULL | Postcode of the theatre address |
| state | VARCHAR | 30 | NOT NULL | State of which the theatre is located |
| country | VARCHAR | 30 | NOT NULL | Country of which the theatre is located |